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CURRENT LITERATURE

BOOK REVIEWS

The ecology of water plants

Long ago the ecological features of the hydrophytes were brought together in comprehensive fashion by SCHENCK in two admirable volumes. Recently Dr. HUGO GLÜCK, a young and enthusiastic investigator, has published three volumes along similar lines, and they are very rich in detailed information; indeed, they may be regarded as encyclopedic in nature. The first two volumes, dealing respectively with the European Alismaceae and the genus *Utricularia* (together with an account of turion formation), have been noticed in these pages.¹ The third and thus far the largest volume, which is now at hand, is very different in scope, treating as a whole the vegetation of freshwater banks, that is, the marginal vegetation of streams and ponds.² This vegetation is essentially that of the belts which are subject to inundation, and embraces, therefore, practically all of the so-called amphibious plants. These plants, of course, are among the most interesting of all plants to ecologists because of their plasticity.

While most of the genera and many of the 124 species treated in this volume are of very widespread distribution, the author limits his studies to central and southern Europe. The work is based on almost numberless field trips to all parts of this vast region, and these observations have been backed up by numerous cultures. The author makes no pretense to completeness, suggesting, indeed, that these are among the most poorly known of all plants, and that they are well worthy of much more careful study; some color is given to this view by GLÜCK's discovery, in these floristically best known of all lands, of entirely new areas for four different species. The author recognizes two "zones" (thus ignoring the Brussels recommendation of 1910 that the term zone be employed henceforth only for the great climatic belts of the earth), one of the land margin with leaves mostly aerial, and one of the water margin with leaves mostly submersed. The subdivision of the "zones" into groups and subgroups is based not on habitat but on leaf form. For example, "zone 1" includes a group with linear leaves (as *Typha*, *Acorus*, *Iris*), a group with petioled entire leaves, a group with petioled divided leaves, etc. Under each group or subgroup the species are considered individually, and under each

¹ BOT. GAZ. 43:67-69. 1907.

² GLÜCK, HUGO, Biologische und morphologische Untersuchungen über Wasser- und Sumpfgewächse. III. Die Uferflora. pp. xxxiv+644. pls. 8. figs. 105. Jena: Gustav Fischer. 1911.

species there is usually a further subdivision into such topics as land form, water form, submersed form, form with floating leaves, etc. The greater part of the work is taken up by the plants of the water margin ("zone 2"). These belong to two categories, so far as leaf form is concerned, those that are homoblastic or with but one leaf type, and those that are heteroblastic or with two leaf types; the heteroblastic water plants are with us well represented by such plants as *Sium* and *Proserpinaca*. Most of the plants of "zone 1" have greatly reduced water forms, many of which are generally unfamiliar, and some of which are known only from cultures; these forms rarely flower. One of the striking discoveries is a water form of a dodder (*Cuscuta alba*) which parasitizes *Isoetes* and water buttercups. Only a few of the species studied live in flowing water. The water forms seem related to low temperatures, and while the land form is essentially a summer form, it can sometimes be produced at other seasons by raising the temperature of the cultures. Most of the species have winter rest periods, but there are some species that vegetate continuously, even in countries with cold winters. Many Mediterranean species have periods of summer rest. These and many other topics are considered in the 40-page summary with which the volume concludes. The book should be in every botanical reference library, for it will serve as a compendium of general ecological information about the plants it treats. It is understood that Dr. GLÜCK is devoting his life to the study of water plants, and we may expect other volumes of this sort in the future.—HENRY C. COWLES.

Plant breeding in Sweden

The extensive series of experiments in plant breeding which have been conducted in Sweden, principally at the Svalöf station, beginning about 1886 and extending with ever increasing efficiency to the present time, are of great interest not only to agriculturists but also to scientists by reason of the problems of inheritance which they involve. Unfortunately very scanty reports of these operations have been available in any but the Swedish language, and these publications have been, and quite rightly so, most largely concerned with practical results that were of special interest to the farmers of Scandinavia. These circumstances will make the present report³ the more useful, prepared as it is by one who has carefully investigated the methods employed and the results obtained at the Swedish stations, and addressed primarily to the scientific reader, but in language intelligible to the general public.

The report contains a brief historical sketch of the inception and development of plant breeding experimentation in Scandinavia, examples of the experiments with different agricultural plants, some of the results obtained, and a summary of the principles now recognized by the plant breeders at Svalöf and followed in their work. These principles are briefly: (1) the recognition

³ NEWMAN, L. H., Plant breeding in Scandinavia. 8vo. pp. 193. figs. 63. Ottawa, Canada: Canadian Seed Growers' Association. 1912. \$1.00.